

WHAT IS CLAIMED IS:

1. An exhaust emission control system of an internal combustion engine, comprising:

5 an exhaust purifying device arranged in an exhaust gas passage extending from the engine, the exhaust purifying device including a NO_x trapping catalyst that traps NO_x in the exhaust gas when an exhaust air/fuel ratio is leaner than stoichiometric and releases the trapped NO_x therefrom when the exhaust air/fuel ratio is richer than stoichiometric, and a particulate filter
10 that collects a particulate matter in the exhaust gas;

a condition detecting device that detects a condition of the particulate filter; and

an exhaust air/fuel ratio control device that controls the exhaust gas from the engine in such a manner that the exhaust
15 gas has a target exhaust air/fuel ratio,

wherein the exhaust air/fuel ratio control device is configured to carry out:

upon changing of the exhaust air/fuel ratio from a stoichiometric or richer side to a leaner side, varying the exhaust
20 air/fuel ratio under the leaner air/fuel exhaust condition in accordance with the condition of the particulate filter.

2. An exhaust emission control system as claimed in Claim 1, in which the condition detecting device estimates an amount of
25 the particulate matter that would be collected and deposited on the particulate filter, and in which the exhaust air/fuel ratio control device varies the target exhaust air/fuel ratio under the leaner air/fuel exhaust condition only when the estimated amount of the collected and deposited particulate matter exceeds a
30 predetermined amount.

3. An exhaust emission control system as claimed in Claim 1, in which the condition detecting device detects a temperature of the particulate filter, and in which the exhaust air/fuel ratio
35 control device varies the target exhaust air/fuel ratio under the

leaner air/fuel exhaust condition when the temperature of the particulate filter exceeds a predetermined temperature.

4. An exhaust emission control system as claimed in Claim 2,
5 in which the exhaust air/fuel ratio control device controls the target exhaust air/fuel ratio under the leaner air/fuel exhaust condition in such a manner as to lower an oxygen concentration in the exhaust gas as the amount of the deposited particulate matter increases.
- 10
5. An exhaust emission control system as claimed in Claim 3,
in which the exhaust air/fuel ratio control device controls the target exhaust air/fuel ratio under the leaner air/fuel exhaust condition in such a manner as to lower an oxygen concentration
15 in the exhaust gas as the temperature of the particulate filter increases.
6. An exhaust emission control system as claimed in Claim 1,
in which the exhaust air/fuel ratio control device varies the target
20 exhaust air/fuel ratio under the leaner air/fuel exhaust condition when the engine is under a predetermined operation condition.
7. An exhaust emission control system as claimed in Claim 1,
in which the exhaust air/fuel ratio control device controls the
25 exhaust air/fuel ratio to the target ratio by controlling an amount of intake air fed to the engine.
8. An exhaust emission control system as claimed in Claim 1,
further comprising an EGR device that feeds a part of the exhaust
30 gas of the engine back to an intake system of the engine.
9. An exhaust emission control system as claimed in Claim 8,
in which the exhaust air/fuel ratio control device controls the
exhaust air/fuel ratio to the target ratio by controlling an amount
35 of the exhaust gas fed back to the intake system of the engine.

10. An exhaust emission control system as claimed in Claim 1, in which the NOx trapping catalyst is arranged upstream of the particulate filter.

5

11. An exhaust emission control system of a diesel engine, comprising:

10 a NOx trapping catalyst arranged in an exhaust gas passage extending from the engine, the NOx trapping catalyst trapping NOx in the exhaust gas when an exhaust air/fuel ratio is leaner than stoichiometric and releasing the trapped NOx therefrom when the exhaust air/fuel ratio is richer than stoichiometric;

15 a diesel particulate filter arranged in the exhaust gas passage at a position downstream of the NOx trapping catalyst, the diesel particulate filter collecting a particulate matter in the exhaust gas;

a first temperature sensor that detects a temperature of the NOx trapping catalyst;

20 a second temperature sensor that detects a temperature of the diesel particulate filter;

an exhaust pressure sensor that detects an exhaust pressure exerted in the exhaust gas passage between the NOx trapping catalyst and the diesel particulate filter;

25 an air/fuel ratio sensor that senses an exhaust air/fuel ratio of the exhaust gas discharged from the diesel particulate filter;

an exhaust air/fuel ratio controller that is capable of varying the exhaust air/fuel ratio when operated; and

30 a control unit that controls the operation of the exhaust air/fuel ratio controller by processing information signals from the first and second temperature sensors, the exhaust pressure sensor and the air/fuel ration sensor,

the control unit being configured to carry out:

35 upon sensing a change of the exhaust air/fuel ratio from a stoichiometric or richer side to a leaner side by the exhaust

air/fuel ratio controller, varying the exhaust air/fuel ratio under the leaner air/fuel exhaust condition in accordance with at least one of the information signal from the second temperature sensor and the information signal from the exhaust pressure sensor.

5

12. In an internal combustion engine system comprising an exhaust purifying device arranged in an exhaust gas passage extending from the engine, the exhaust purifying device including a NOx trapping catalyst that traps NOx in the exhaust gas when an exhaust air/fuel ratio is leaner than stoichiometric and releases the trapped NOx therefrom when the exhaust air/fuel ratio is richer than stoichiometric, and a particulate filter that collects a particulate matter in the exhaust gas; a condition detecting device that detects a condition of the particulate filter; and an exhaust air/fuel ratio control device that controls the exhaust gas from the engine in such a manner that the exhaust gas has a target exhaust air/fuel ratio,

10

15

a method for controlling the exhaust air/fuel ratio control device comprising:

20

detecting a change of the exhaust air/fuel ratio from a stoichiometric or richer side to a leaner side; and

forcing the exhaust air/fuel ration control device to vary the exhaust air/fuel ratio under the leaner air/fuel exhaust condition in accordance with the condition of the particulate filter.

25